Leveraging Satellite Data in Public Communication of Fire Science

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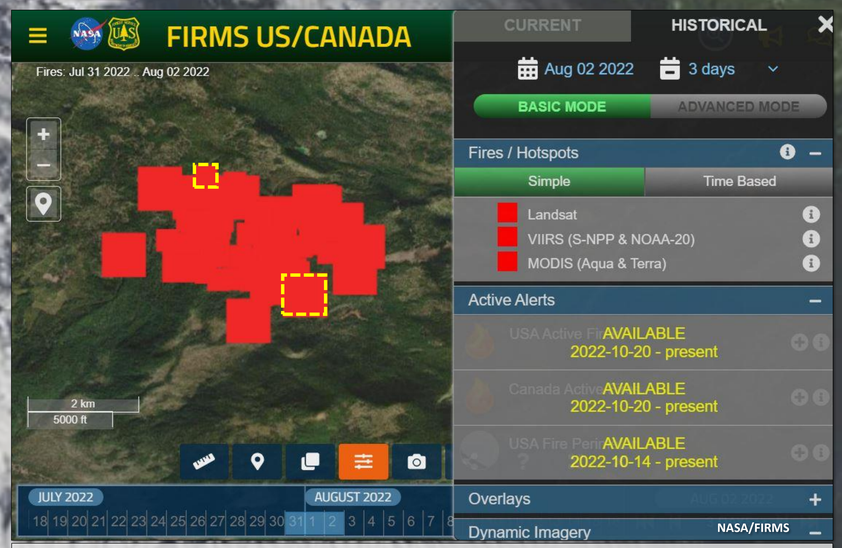


Figure 1. Windigo Fire on NASA's FIRMS Fire Detection Map. Wildfires can be tracked using thermal anomalies detected by VIIRS (375m resolution), and MODIS (1 km resolution). The representation on this map sometimes causes confusion for members of the public unfamiliar with limitations of spatial resolution, and in some instances has resulted in fire managers needing to respond to public concerns regarding the fire's location rather than focusing on managing the fire.

Acknowledging and clearly communicating limitations in data is crucial for public trust, participation, and interagency collaborative landscape management and fire response.

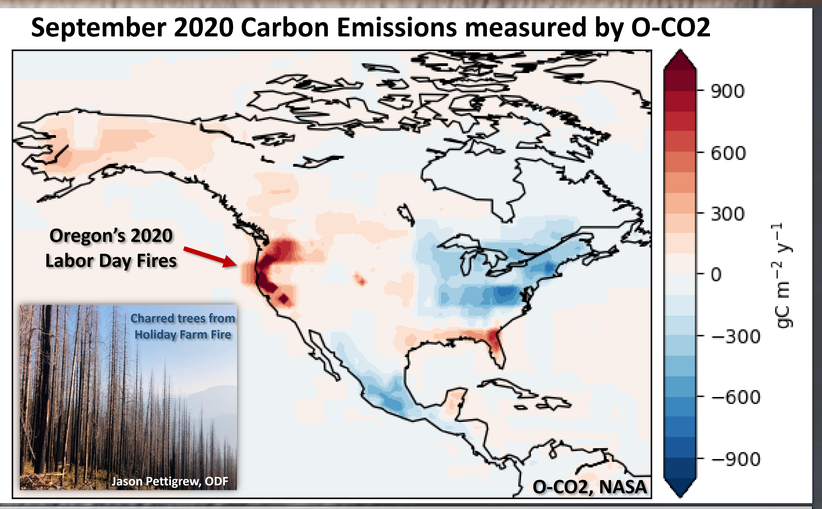
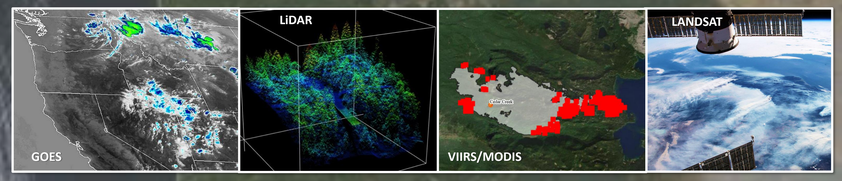


Figure 2. September 2020 carbon emissions measured by the O-CO2 satellite. Many fires were burning in California and Oregon, and carbon emissions reflect significant acreage of biomass burning. Charred trees remain as evidence.

Why NASA and Public Fire Science Communication?

Public misperceptions regarding fire science present a challenge for proactive fire risk reduction and can delay effective fire response, increasing risk of intense fires and post-fire impacts. Satellite data can visually communicate fire science for a range of audiences and foster conversation around effective fire management throughout the fire cycle.



Space and Airborne Fire Data

Resource	What does it measure?	Resolution	Revisit
VIIRS	Thermal anomalies; fire intensity; tracks fire spread	375 m	Daily
MODIS		1 km	Daily
LANDSAT	True color; infrared imagery	30 m	16 d
ECOSTRESS	Evapotranspiration; heat	70 m	Daily (on ISS)
GEDI	LiDAR measurements of fuels and biomass from ISS	1 km	
FIREX-AQ	Air quality chemistry, smoke, and fuels in continental U.S.	Varies	Summer 2019
O-CO2	Carbon dioxide emissions	2.25 x 1.29 km	16 d
Sentinel (ESA)	True-color; infrared; soil moisture	10 m	5 d
NISAR	Soil moisture (launch: 2024)	3 – 10 m	6 d
GOES	Atmospheric moisture	0.5-1.0 km	15 min

The post-fire landscape is the pre-fire landscape.

Impact of Prescribed Fire on Burn Severity

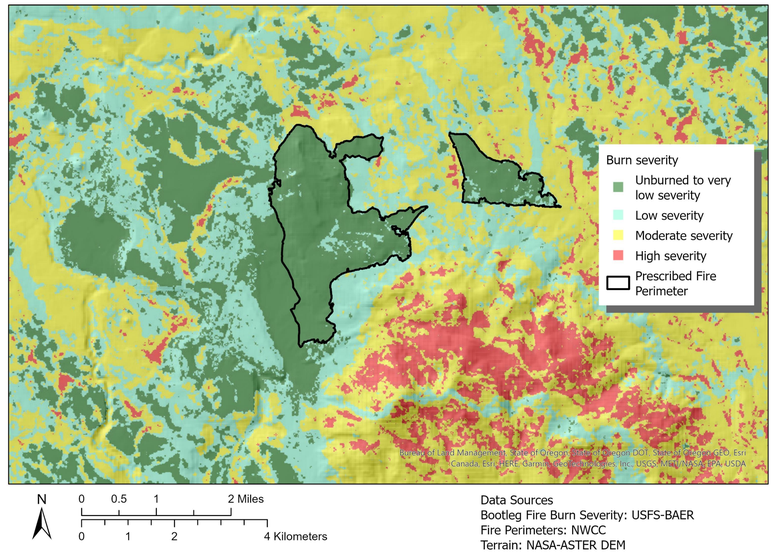


Figure 3. Fire burn severity following Oregon's July 2021 Bootleg Fire. The area outlined in black was treated with a prescribed burn in May 2021; green areas next to the larger 2021 prescribed burn were treated in 2018-2019. The low burn severity in this region compared to surrounding areas demonstrates that prescribed burns can positively impact vegetation survival in more intense fires.

What is Effective Public Fire Science Communication?

Challenges/Barriers
- Fire science is nuanced
- Short public attention span
- Politically sensitive
- Misperceptions of fire
- Public fear of all fire
- Smokey the Bear legacy

Strategies/Opportunities
- Non-technical and short
- Humor OK as appropriate
- Use visuals and videos
- Accessible and intuitive
- Tell a compelling story
- Interactive models

With fires impacting more people, more structures, and more land, an informed public is essential, yet can be challenging due to nuances of fire science. Spaceborne/airborne data can help tell the story of fire: how we got here, why are fires more severe, and how do we achieve a healthy balance with fire?

How do you use satellite data?

(In fire or landscape health)

Do you have any feedback?

(accessibility, errors, metadata, requests)

Fire science communication tips

(insight into public fire communication?)